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Comparative analysis of codes white given by the emergency departments of two different third level hospitals in Ankara

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ABSTRACT

Aims: In our study, we aimed to compare the codes white given by the emergency services of two tertiary hospitals in Ankara, to reveal the significant differences between them and to discuss the reasons that may lead to these differences.

Methods: In our study, we compared the codes white data given from the Emergency Medicine Department of Bilkent Ankara City Hospital (ABCH) and Ankara Training and Research Hospital (ATRH) between 01.01.2021 and 31.12.2022. We classified the data according to the gender, occupation, working hours of the violence, the person who caused the violence, and the type of violence. For research analysis, we grouped the data using Windows-based Microsoft 365 Excel, and for statistical analysis, we used IBM SPSS version 26.

Results: The gender that was exposed to violence more in ABCH was women, the most frequent perpetrators were the relatives of the patients, and the type of violence experienced was verbal violence. In ATRH, male health workers were the most frequently exposed to violence, while the most frequent perpetrator was the patient himself, and more cases of physical violence were reported.

Conclusion: There are significant differences between the incidents of violence in the emergency departments of the two hospitals, which have different socio-cultural environments due to their location.

Keywords: Emergency medicine, code white, violence

INTRODUCTION

Healthcare workers are at risk of violence around the world. In the World Health Organization's (WHO) report on violence and health, violence is defined as the intentional use of physical force or power, threatened or actual, against oneself, another person, or a group or community, resulting in injury, death, psychological harm, or deprivation, or having a high likelihood of resulting in such outcomes.[1]

It has been observed that healthcare workers experience physical violence at variable rates, ranging from 8% to 38% at different points in their careers. Additionally, more healthcare workers are subjected to threats and verbal attacks than those reflected in the reported data. Most violence is perpetrated by patients and visitors. Among the categories of healthcare workers most at risk are nurses, emergency room personnel, healthcare aides, and auxiliary staff responsible for hospital security. On October 3, 2002, the World Health Organization (WHO) published its first global report on violence in healthcare. This report is significant because it represents the first comprehensive examination of violence in healthcare on a global scale. The report includes information about the definition of violence, its classification, who it affects, and what needs to be done about it.[1]

A meta-analysis that included sixty articles published between 2007 and 2017 revealed that emergency department healthcare workers who encounter psychiatric patients or individuals under the influence of drugs or alcohol face a higher risk of physical violence than patients in a normal state of consciousness. These findings support the hypothesis that emergency departments should have an action plan aimed at assessing the risk of violence from each patient and notifying colleagues if a patient is at risk of violence.[2]

In some studies, healthcare workers who experienced verbal, physical, and sexual violence reported experiencing anger, a decline in job performance, deterioration in mental health, disruption in social life, and strained interpersonal relationships. It was also found that healthcare workers who

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experienced physical violence were more likely to consider leaving their jobs than those who experienced other forms of violence.[3]

In our study, we compared the qualitative and quantitative characteristics of "code white" incidents reported as a result of violence in two emergency departments serving different socio-cultural communities with different physical conditions. Among our hypotheses was the expectation that the type of violence experienced in these two hospitals would be proportionally different. We also anticipated that the tertiary care hospital, which operates under more challenging socio-cultural conditions, would experience more cases of physically oriented violence. Furthermore, considering the hospital's proximity to residential areas, we believed there would be more outpatient visits at this hospital, and thus, the person responsible for the "code white" incident would often be the patient themselves.

METHODS

The study was carried out with the permission of Ankara City Hospital Clinical Researches Ethics Committee (Date: 22.03.2023, Decision No: E1-23-3403). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

This study was an observational, retrospective, and cross-sectional multicenter study. A comparative analysis was conducted on white code data provided following incidents of violence that occurred in the emergency departments of Ankara City Hospital (ABCH) and Ankara Training and Research Hospital (ATRH) between January 1, 2021, and December 31, 2022. The main reason for selecting these two hospitals was their service to different socio-cultural communities due to their geographical locations and different physical facilities. White codes provided outside the emergency department were not included in the study.

When all white code data from the emergency department were examined, a total of 83 white code records for 2021 and 121 white code records for 2022 were included in the study. The data were obtained through official correspondence from the occupational health units of both hospitals, resulting in 204 white code records in the data pool. The parameters in our study were grouped as follows: gender of the assaulted staff, occupation, type of violence, and time interval in which the violence occurred. Regarding the type of violence, we categorized it as verbal, verbal and physical, and physical violence without a verbal component. We divided the time intervals as 08:00-16:59, 17:00-23:59, and 00:00-07:59. In some cases of violence, multiple genders and occupational influences were involved in a single incident. Therefore, to ensure accurate statistical analysis, we created a gender group in which both male and female genders were affected and similarly, we specified a new group for cases with multiple occupational influences.

Statistical Analysis

The data were organized using Microsoft 365 Excel on a Windows-based platform. For statistical analysis, Pearson's chi-squared test and Fisher 's exact test from IBM SPSS Version 26 were employed. Results are presented as percentages (%), and data resulting in $p<0.05$ were considered statistically significant.

RESULTS

Based on the data, we observed that a total of 236 healthcare personnel were affected by these incidents of violence. Among them, 139 (58.8%) were doctors, 54 (22.8%) were nurses, and 28 (11.8%) were security personnel. The amount of female healthcare personnel affected by the violence was 120 (50.8%), while the amount of male personnel was 116 (49.1%). The cases of violence were categorized as follows: 168 (82.3%) verbal, 27 (13.2%) verbal and physical, and 9 (4.4%) physical.

When the perpetrators of violence were examined, it was found that out of 204 cases, 118 (57.8%) were caused by relatives of the patients, 79 (38.7%) by the patients themselves, and 5 cases (2.4%) involved both the patient and their relative causing the violence. In two cases of violence, it was reported that 112 healthcare personnel were responsible for the violence. Among the 204 cases, 171 (83.8%) were related to ABCH, whereas only 33 (16.1%) were related to ATRH. Among the 204 white code incidents, 103 cases (50.4%) involved only female victims, 92 cases (45%) involved only male victims, and in 9 white code cases (4.4%), both female and male genders were affected together. In ABCH, where the perpetrator of violence was more often a patient 's' relative (62.6%), in ATRH, it was observed that the patient themselves (57.6%) more frequently caused the violence ($p=0.002$).

When considering the gender of the healthcare personnel exposed to violence, it was found that female personnel predominated for ABCH (52.6%), while for ATRH, male personnel (42.4%) were more likely to report codes white ($p<0.001$). Regarding the type of violence, verbal violence was more prevalent in ABCH (86%), whereas physical violence incidents (36.3%) were proportionally higher in ATRH ($p=0.002$).

In terms of codes white given in 2021, ABCH 's Emergency Medicine Clinic had 74 codes white, whereas ATRH's Emergency Medicine Clinic had only 9. Based on the 2021 data, ABCH's s codes white consisted of 46 (63.3%) females and 29 (38.6%) males, with 83.7% being verbal violence and 16.1% being physical violence. When codes white were examined in terms of working hours, they were most frequently given during the hours of 08:00-16:59, accounting for 43.2% of the total. In the ranking of healthcare workers most frequently exposed to violence, doctors were at the top with 62.6%, followed by nurses at 21.3%, and security personnel at 10.6%. Among the perpetrators of violence, relatives of patients were the most frequent (64.8%) in ABCH. In contrast, in ATRH's Emergency Medicine Clinic, the patients themselves were more often responsible for the violence (**Table 1**).

According to the data for 2022, from the Emergency Medicine Clinic of ABCH, there were 48 codes white (47.5%) for females and 53 (52.4%) for males. Among these, 88.6% were cases of verbal violence, whereas 11.2% involved physical violence. When codes white were examined in terms of working hours, it was observed that they were most frequently given during the hours of 17:00-23:59, accounting for 39.1% of the total. In the ranking of healthcare workers most frequently exposed to violence, doctors were at the top with 57.4%, followed by nurses at 24.7%, and security personnel at 11.8%. Among the perpetrators of violence, relatives of patients were the most frequent, accounting for 60.8% of cases.

Table 1. Distribution of white code data given from Ankara Bilkent City Hospital and Ankara Training and Research Hospital Emergency Departments in 2021, according to the researched parameters

Year 2021	ABCH n (%)	ATRH n (%)
The person causing violence		
Patient	25 (33.%7)	6(66%)
Patient's relative	48 (64.8%)	3(33%)
Patient and relative	0	0
Other (Staff working in ambulance)	1 (1.3%)	0
Occupation		
Doctor	47 (62.6%)	6 (50%)
Nurse	16 (21.3%)	3 (25%)
Radiology technician	1 (1%)	0
Security guard	8 (10.6%)	3 (25%)
Sars-cov-2 PCR recruitment personnel	1 (1%)	0
Data recording personnel	2 (2%)	0
Gender of the victim of violence		
Female	46 (61.3%)	5.36±4.23
Male	29 (38.6%)	7 (58%)
Type of violence		
Physically	5 (6.7%)	57.60±34.23
Verbal	62 (83.7%)	57.60±34.23
Verbal and physical	7 (9.4%)	0
Event time		
08:00-16:59	32 (43.2%)	2 (22%)
17:00-23:59	29 (39.1%)	2 (22%)
00:00-07:59	13 (17.5%)	5 (55%)

ABCH: Ankara Bilkent City Hospital, ATRH: Ankara Training and Research Hospital

Table 2. Distribution of white code data given from Ankara Bilkent City Hospital and Ankara Training and Research Hospital Emergency Departments in 2022, according to the researched parameters

Year 2022	ABCH n (%)	ATRH n (%)
The person causing violence		
Patient	35 (36%)	13 (54.1%)
Patient's relative	59 (60.8%)	8 (33.3%)
Patient and relative	2 (2%)	3 (12.5%)
Other (112 staff)	1 (1%)	0
Occupation		
Doctor	58 (57.4%)	28 (58.3%)
Nurse	25 (24.7%)	10 (20.8%)
Radiology technician	4 (3.9%)	2 (4.1%)
Security guard	12 (11.8%)	5 (10.4%)
Sars-cov-2 PCR recruitment personnel	0	0
Data recording personnel	2 (1.9%)	1 (2%)
	0	2 (4.1%)
Gender of the victim of violence		
Female	48 (47.5%)	19 (39.5%)
Male	53 (52.4%)	29 (60.4%)
Type of violence		
Physically	3 (3%)	1 (4.1%)
Verbal	86 (88.6%)	16 (66.6%)
Verbal and physical	8 (8.2%)	7 (29.1%)
Event time		
08:00-16:59	24 (24.7%)	6 (25%)
17:00-23:59	38 (39.1%)	9 (37.5%)
00:00-07:59	35 (36%)	9 (37.5%)

ABCH: Ankara Bilkent City Hospital, ATRH: Ankara Training and Research Hospital

The difference in ATRH data was that the patient was the most frequent perpetrator of violence with 54.1% and the victim was male with 60.4% (Table 2).

It appears that the highest number of codes white was issued in January 2022 from the Emergency Medicine Clinic of ABCH. The months with the lowest number of codes white issued for ABCH were February, April, and September in 2021, and October in 2022. In contrast, for ATRH, no codes white were issued in January, March, May, July, November, and December in 2021. In 2022, there were no codes white issued in May alone. Additionally, we observed an increase in the number of codes white issued between 2021 and 2022 for both hospitals. It is notable that ABCH 's Emergency Medicine Clinic consistently experienced more incidents of violence each month (Figure 1).

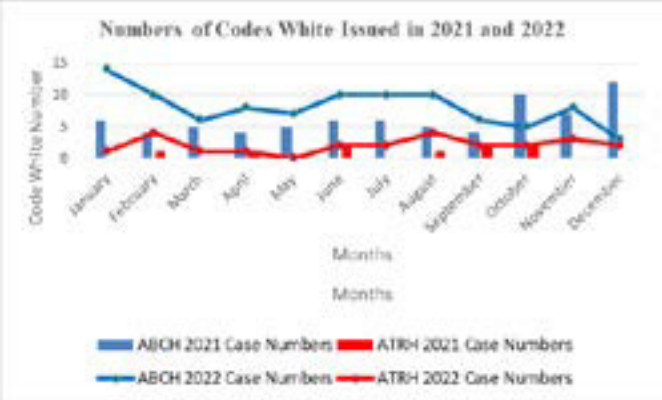

Figure 1. Number of Code White

When considering incidents of violence among healthcare workers based on gender in the two hospitals, it was observed that female healthcare workers (52.6%) were more frequently exposed to violence in the Emergency Medicine Clinic of ABCH, whereas male healthcare workers (42.4%) were more likely to report codes white in ATRH. In both years, a total of 204 white code cases were reported, indicating that 236 healthcare workers experienced violence in their workplace. Of these, 52.2% were female. Because multiple genders were involved in some incidents of violence, a combined group of both male and female genders was specified for statistical interpretation. Pearson 's's chi-square test was used ($p<0.001$), and a statistically significant difference between the hospitals was detected (Table 3).

From a statistical analysis perspective, it was noted that there were multiple occupational groups affected by the same incidents of violence; therefore, a separate variable was specified. While Pearson's chi-squared test may have appeared significant in SPSS data analysis, the analysis result was deemed unreliable due to the non-homogeneous distribution of the data volume (Table 3).

When the codes white given by the emergency medicine clinics of both hospitals for the years 2021 and 2022 are examined, it is seen that the person who caused the code white is the patient's relatives with 62.6%, the patient himself with 35.1%, and the patient himself with relatives 1.2%. we reported that he was a relative. In the ATRH Emergency Medicine Clinic, we observed that 57.6% of the patients themselves, 33.3% of the patients' relatives, and 9.1% of the patients and their relatives caused the code white. While the person who causes violence in AHD is often the patient's relatives, it was reported that the patient himself caused the violence in AHD (Table 3).

In the comparison made between hospitals based on the sum of the data of both years, in the ABCH Emergency Medicine Clinic, 86.0% was verbal violence, 4.7% was physical violence, 9.4% was verbal and physical violence. At the ATRH Emergency Medicine Clinic, we reported 63.6% as verbal violence, 3% as physical violence, and 33.3% as verbal and physical violence. Of all the violent incidents in the two hospitals, 82.2% were reported as verbal, 12.7% as physical, and 4.4% as verbal and physical violence. There was a significant difference when the type of violence in the code white cases experienced during the period when data was collected in the two hospitals subject to our study was statistically examined. According to this result, more cases of physical violence are reported in the ATRH Emergency Medicine Clinic than in the ABCH Emergency Medicine Clinic (**Table 3**).

When the time interval in which the total violent incidents occurred within two years is most frequently experienced, it is seen that in the ABCH Emergency Medicine Clinic, the most common time is between 17:00 and 23:59, with a rate of 39.2%, and in the ATRH Emergency Medicine Clinic, this rate is 42%. It appeared to be between 4 and 00:00-07:59. When examined statistically, no significant difference was detected between them (**Table 3**).

Table 3. Comparison of ABCH and ATRH in terms of the gender of the perpetrators of violence, the profession of the healthcare personnel exposed to violence, the perpetrators of violence, the type of violence and the time interval of the event

		Hospital				
		ABCH		ATRH		
		n	%	n	%	p
Gender of the victim of violence	Female	90	52.6	13	39.4	<0.001
	Male	78	45.6	14	42.4	
	Male and female together	3	1.8	6	18.2	
Professional group	Doctor	101	59.1%	19	57.6%	0.012
	Nurse	38	22.2%	8	24.2%	
	Security Staff	20	11.7%	1	3.0%	
	Radiology technician	4	2.3%	1	3.0%	
	More than one medical staff	2	1.2%	4	12.1%	
	IT personnel	6	3.5%	0	0.0%	
Perpetrator of violence	Patient	60	35.1%	19	57.6%	0.002
	The relatives of the patient	107	62.6%	11	33.3%	
	Patient and relative	2	1.2%	3	9.1%	
	Other	2	1.2%	0	0.0%	
Type of violence	Verbal violence	147	86.0%	21	63.6%	0.002*
	Verbal and physical violence	16	9.4%	11	33.3%	
	Physical violence	8	4.7%	1	3.0%	
Event time range	08:00-16:59	56	32.7%	8	24.2%	0.251
	17:00-23:59	67	39.2%	11	33.3%	
	00:00-07:59	48	28.1%	14	42.4%	

ABCH: Ankara Bilkent City Hospital, ATRH: Ankara Training and Research Hospital, *Fisher's Exact test

DISCUSSION

Emergency departments are high-risk environments for violence in healthcare compared with all other healthcare settings. Emergency healthcare workers deal with a wide range of acute and chronic issues every day, including sudden deaths, trauma, and hospital overcrowding. They often face unpredictable stressors and frequently deal with patients who can exhibit aggressive behavior because of factors such as the urgency of their condition, long waiting times, substance intoxication, or alcohol poisoning.[4]

The consequences of violence against healthcare workers include not only physical injuries but also psychological outcomes. Problems such as outbursts of anger, fear, or anxiety, symptoms of post-traumatic stress disorder, guilt, self-blame, shame, decreased job satisfaction, and increased rates of leaving work have been reported as short- and long-term effects of violence in the healthcare sector.[5,6]

Among the research hypotheses, we expected that there would be more white code incidents in the ABCH Emergency Medicine Clinic, which is assumed to have a higher patient volume. Another hypothesis was that the ATRH Emergency Medicine Clinic, which is considered to work under challenging socio-cultural conditions due to its location, would have a higher percentage of codes white with physical violence content. In addition, we predicted that violence incidents would occur more frequently during daytime working hours when patient volume is higher. We did not expect any gender differences in the health workers affected by violence; however, we expected that more white code incidents would involve patient relatives in the hospital where more yellow and red triage code patients were treated. We also expected that nurses would be the most frequent group to report codes white, and that codes white would be most common during working hours.

When we compared the data from our study with studies conducted worldwide and in Turkey, we found both similarities and notable differences. In a joint report by WHO, ILO (International Labour Organization), and ICN (International Council of Nurses) in 2002, when the frequency of violence against healthcare workers in different countries was examined, it was determined that healthcare workers were exposed to physical violence in the range of 3% to 17%, verbal violence in the range of 27% to 67%, psychological violence in 23%, sexual violence in the range of 0.7% to 8%, and ethnic violence (racism) in the range of 0.8% to 2.7%.[7]

In a study by Torun N.[8] in Turkey in 2018, white code data obtained from the Ministry of Health between 2012 and 2018 were retrospectively examined and grouped. Verbal violence was reported as the dominant type of violence, with July (11%) being the month with the highest incidence of violence, and December (5%) as the month with the lowest incidence. In our study, however, it was observed that the winter months (December and January) had the highest incidence of violence. This may be because of the prolonged length of stay for patients in ABCH, especially during the winter months. Patients with COPD (Chronic obstructive Pulmonary Disease) or asthma exacerbations who visit the emergency department have a higher need for hospitalization during this period, and the length of stay for inpatients also increases. The number of admission queues for service or intensive care in our hospital increases during the winter months.

In a white code study conducted by Polat and Çırak[9] at Bakırköy Dr. Sadi Konuk Training and Research Hospital, when 345 white code notifications between January 2016 and December 2018 were categorized into three categories: verbal violence, physical violence, and verbal and physical violence, it was reported that there were 312 cases of verbal violence, 31 cases of verbal and physical violence, and 2 cases of physical violence. In the analysis of 345 violence incidents,

218 (63.1%) female and 127 (36.8%) male healthcare personnel were exposed to violence. It was observed that 71.8% of those exposed to violence were doctors, 20.8% were nurses. The highest number of White Code notifications was reported to be between 08:00 and-16:59 hours. In our study, the occupational group most frequently exposed to violence in the ABCH Emergency Medicine Clinic was doctors (59.6%), followed by nurses (23.2%), security personnel (11.3%), radiology technicians (2.8%), and IT personnel (2.2%). In the ATRH Emergency Medicine Clinic, the percentages of occupational groups giving codes white were 56.6% doctors, 21.6% nurses, and 13.3% security personnel. In our study, we found that verbal violence was the most common type of violence and that women were more frequently exposed to violence.

In a study conducted by Devebakan et al.[10], it was reported that doctors were the most victims of violence and the most common type of violence was verbal violence. The same study also showed that the most common causes of violence are communication problems, misunderstandings, treatment dissatisfaction and long waiting time.Similarly in our study, we found that verbal violence was the most common type of violence and that women were more frequently exposed to violence.

In a study published by Albay and Nizam[11] in 2022, a retrospective analysis of 180 white code data between January 2014 and December 2021 was conducted at Fırat University, and it was reported that the most intense hours of violence were between 08:00 and 17:00 hours (52.2%). It was also reported that the most frequent victims of violence were females, the most common profession giving codes white was research assistant doctors, and the most common type of violence was verbal violence. In our study, we did not find any significant differences in terms of the number of hours when violence occurred between hospitals.

Limitations

One limiting factor in our study was the limited data pool for ATRH. The different patient volumes in the emergency departments of the two hospitals may have contributed to this situation. Additionally, this situation can be questioned in terms of factors that may cause hospital employes to refrain from giving codes white, factors that may affect the knowledge levels of employes from both hospitals regarding giving codes white, or whether the infrastructure necessary for giving codes white is provided. In future multicenter studies, the average daily patient admission numbers between hospitals can be included in the studies in detail.

CONCLUSION

The data obtained from our study showed similarities with studies conducted worldwide and in Turkey. Furthermore, our study holds the distinction of being the first to compare white code data from two different emergency departments in multicenter hospitals based on a literature review. In studies conducted in Turkey, violence incidents in the hospital where the study was conducted are generally compared with violence incidents nationwide. As emphasized in previous studies, emergency departments are the most common locations for violence incidents.

It has been reported that violence in the healthcare sector is on the rise worldwide. Violence is, first and foremost, a public health issue with primary and secondary consequences. Both patients and healthcare workers suffer from it. Therefore, to improve the quality of healthcare services, strategies should be developed to prevent violence, taking into account the physical conditions and socio-cultural environments of all hospitals in terms of potential violence incidents. Plans should be made to raise public awareness about preventing violence, and healthcare policies should be reviewed and improved.

ETHICAL DECLARATIONS

Ethics Committee Approval

The study was carried out with the permission of Ankara City Hospital Clinical Researches Ethics Committee (Date: 22.03.2023, Decision No: E1-23-3403).

Informed Consent

Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declared that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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